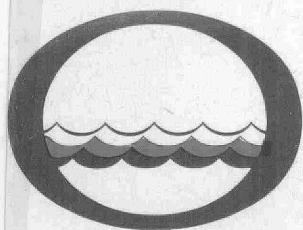


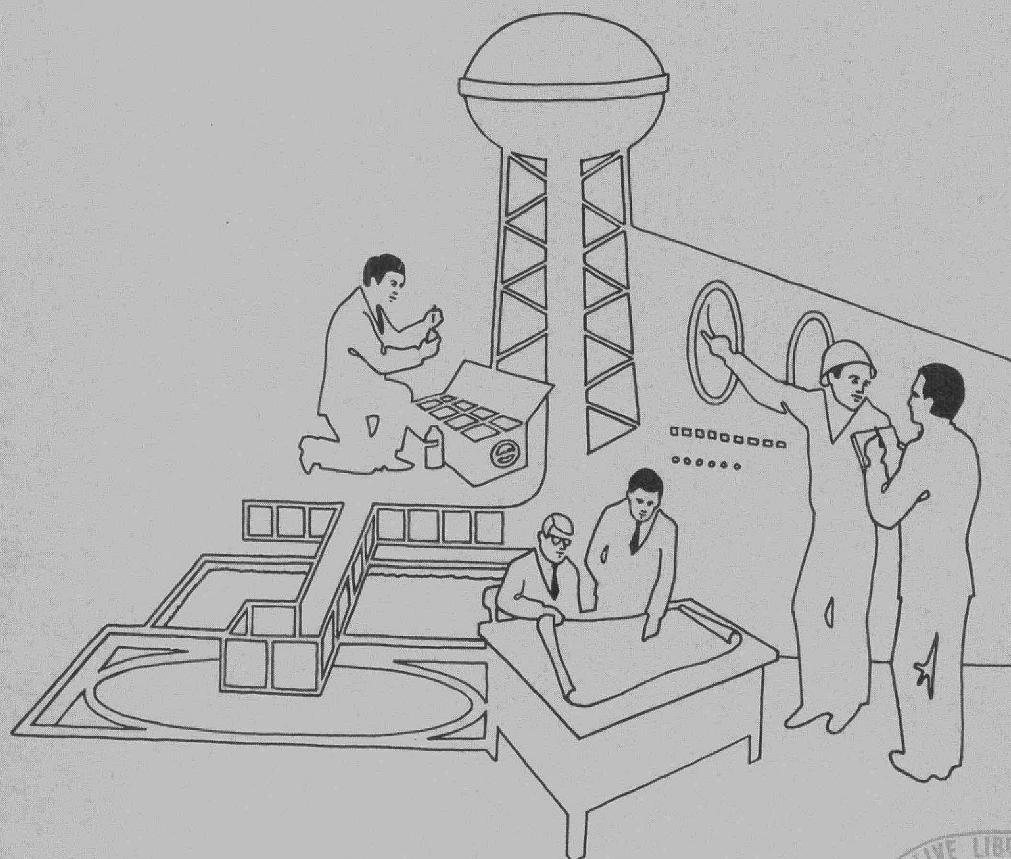
CA20N
WR 610
1971
H31



Water management in Ontario

Ontario
Water Resources
Commission

District
Engineers
Branch



OUTFALL SURVEY

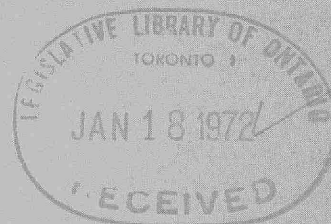
of

HIGHLAND CREEK AND TRIBUTARIES

within the

MUNICIPALITY OF METROPOLITAN TORONTO

1971



Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

CA2012
WK 610
1971
H31

REPORT ON
AN OUTFALL SURVEY
OF
HIGHLAND CREEK AND TRIBUTARIES
WITHIN
THE MUNICIPALITY OF METROPOLITAN TORONTO

DISTRICT ENGINEERS BRANCH
DIVISION OF SANITARY ENGINEERING
DECEMBER, 1971

TABLE OF CONTENTS

	<u>PAGE</u>
1.0 SUMMARY	1
2.0 RECOMMENDATIONS	3
3.0 INTRODUCTION	4
4.0 GENERAL	
4.1 Watershed Data	6
4.2 Highland Creek Treatment Plant	6
4.3 Water Quality	7
4.4 Photographs	7
5.0 ANALYTICAL RESULTS	
5.1 General	10
5.2 Main Branch	11
5.3 North Branch	12
5.4 West Branch	12
5.5 Stream Survey	13
5.6 Discussion of Results	14
TABLES	
1 - Analytical Results - Main Branch	16
II - Analytical Results - North Branch	18
III - Analytical Results - West Branch	20
IV - Analytical Results - Stream Survey	24
APPENDICES	
I - Points of Discharge to Main Branch	26
II - Points of Discharge to North Branch	28
III - Points of Discharge to West Branch	32
IV - Sampling Point Locations - Stream Survey	40
V - Meteorological Data	41
VI - Sewage Analysis - Highland Creek WPCP	42
VII - Glossary	43
MAPS	
HIGHLAND CREEK (WEST HALF)	inside
HIGHLAND CREEK (EAST HALF)	back cover

1.0 SUMMARY

This report describes a survey of Highland Creek and its tributaries carried out in 1971 by staff of the Ontario Water Resources Commission. The purpose of the survey was to locate and sample (if possible) all sources and potential sources of inflow to the creek, and to evaluate the quality of those which were sampled.

The results are presented chiefly in the form of maps and tables, with a minimum of accompanying text. The maps show all of the creek and the sampling points, and Appendices I to IV provide a brief description of each point. Tables I to IV present the results of chemical analyses and bacteriological examinations performed on the samples at the OWRC laboratories. A total of 320 points are indicated on the maps and, of these, 126 were actually sampled. In addition, it is likely that some sewer outfalls, drains, small watercourses, etc., were overlooked during the course of the survey.

By comparing the laboratory results from this survey with the provisions of the Metropolitan Toronto By-Law 2520, it is possible to evaluate in a rough way the acceptability of the various discharges. While it is pointed out that a single sample result has limited significance, a number of

the outfall effluents were of such poor quality that this report recommends immediate corrective action by the municipality at those locations.

Some mention is made of the effect of the Highland Creek treatment plant on the water quality, and a few photographs are included to give the reader some visual impression of the creek.

2.0 RECOMMENDATIONS

The municipality of the Borough of Scarborough should now proceed as follows:

1. Investigate to find and correct the cause or causes of the poor quality of effluent from the points noted in section 5.6 of this report.
2. Establish the quality of effluent from the other points within the municipality, and institute corrective measures to bring the quality of these effluents at least to within the limits established by Metropolitan Toronto By-Law 2520.

3.0 INTRODUCTION

This is the second in a series of reports planned by the Ontario Water Resources Commission to deal with outfall surveys of the major watercourses within Metropolitan Toronto. The objectives of the surveys are to gather information to facilitate the preparation of plans showing all sources or potential sources of flow into these watercourses, and to enable at least a preliminary assessment of the quality of those flows to be made.

This particular survey was carried out by field staff of the District Engineers Branch, and comprised one sampling run along Highland Creek and its main tributaries. Most of the field work was done during the week of May 10, 1971, with supplementary runs done on two days in August. Plans of the drainage basin showing the outfall locations and sampling points were prepared by the draughting office of the Water Quality Surveys Branch, and laboratory analyses of the samples were carried out by the Division of Laboratories.

Naturally, the field work for this survey was done under a variety of weather conditions, which are indicated in Appendix V using data obtained from the Meteorological Branch of the Federal Department of Transport. It must be recognized that local weather conditions have a considerable effect upon the quality of most discharges, and therefore

sample results from different dates cannot be compared directly.

Also, as was pointed out in the earlier Don River report, there are inherent hazards in using analysis results from a single sampling run to evaluate the acceptability of the discharge from any particular outfall; the quality of any such flow is almost sure to vary with time and with weather conditions. Thus, the results presented herein should in most cases be confirmed by further sampling before corrective action is taken. However, some of the results obtained from this survey were sufficiently adverse to warrant immediate remedial measures by the municipality; the offending outfalls are listed in section 5.6.

This information is being provided now as a preliminary indication of the problem areas to the municipality (in this case, the Borough of Scarborough), whose responsibility it is to regulate the quality of discharges to the creek.

4.0 GENERAL

4.1 Watershed Data

Highland Creek drains an area of about 40 square miles, virtually all of it within the Borough of Scarborough.. There are two major tributaries, namely the North and West Branches, whose confluence is in the West Hill area about 4.7 miles upstream of the point where the Main Branch empties into Lake Ontario.

On average, the North Branch falls 32 feet per mile, while the West Branch falls 25 feet per mile. Each branch has several smaller tributaries, of which the main ones were sampled.

Maps of the creek, showing sampling points, are included at the back of this report.

4.2 Highland Creek Treatment Plant

Only one sewage treatment plant is located in this drainage basin. It is Metropolitan Toronto's Highland Creek Water Pollution Control Plant just north of the CNR tracks near the mouth of the creek. With a design capacity of 16 MIGD (million Imperial gallons per day), it currently provides adequate secondary treatment to about 14 MIGD. Virtually all of the area served by this plant is on a separate sewer system.

Appendix VI shows the results of a laboratory analysis on composite samples of the plant influent and effluent taken in August, 1971.

An expansion programme which is now in the early stages will double the capacity of the treatment plant. In addition, a project to provide an effluent outfall into the lake to replace the existing outfall to Highland Creek is under development.

4.3 Water Quality

Since 1964, samples have been taken regularly throughout each year at a point near the mouth of Highland Creek, as part of the OWRC's Water Quality Monitoring Program. Unfortunately, however, the sampling point has been located downstream of the outfall from the Highland Creek Water Pollution Control Plant. Thus, while the available results cover a period of several years, they probably reflect the performance of the sewage treatment plant more than the overall quality of the creek. For this reason, these data have not been included in this report.

4.4 Photographs

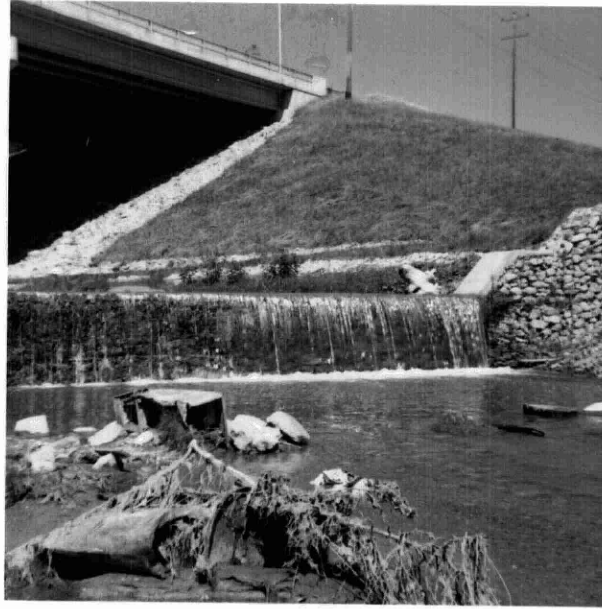
The appearance of Highland Creek varies considerably along its length, fluctuating between the extremes of a clear sparkling stream and a dirty, garbage-filled watercourse. The following photographs portray several different aspects of the creek, at points along the sections that were surveyed.

It should perhaps be pointed out here that, along a few portions of Highland Creek, much of the visible pollution during the summer of 1971 was due to silt stirred up by construction projects adjacent to the creek or by bank stabilization work. The latter programme is being carried out by the Metropolitan Toronto and Region Conservation Authority, and will undoubtedly improve the appearance of the creek in the long run.

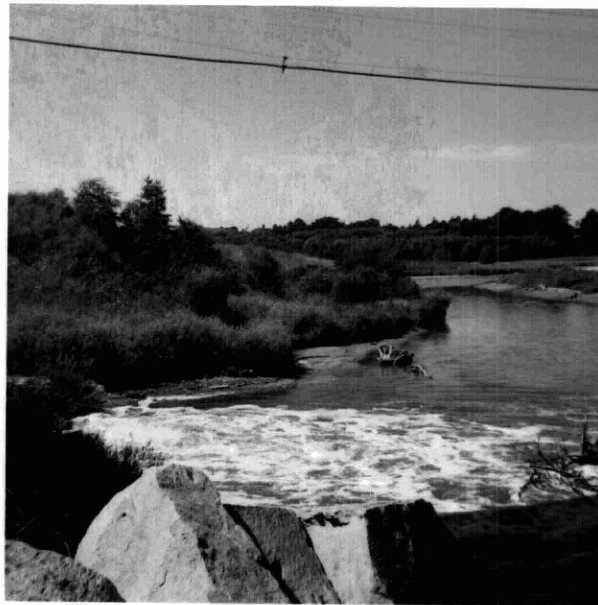
Part of North Branch in a construction area, showing stone gabion in left foreground.



Silting in North Branch above Ellesmere Road.



Debris in creek at MTRCA
spillway south of Ellesmere
Road bridge.



Foaming effluent from
Highland Creek WPCP, near
mouth of creek.

5.0 ANALYTICAL RESULTS

5.1 General

For each of the samples collected, chemical and bacteriological results were obtained and tabulated (see Tables I to IV). The routine chemical analyses requested were BOD₅, solids (total, suspended and dissolved), and phenols; while total coliform and faecal coliform determinations were requested on the bacteriological samples. In addition, chemical analyses for iron, chlorides, and anionic detergents were done on certain samples where high concentrations of these substances were suspected. Some additional metals analyses were performed on samples collected in the stream survey described in Section 5.5.

As it was pointed out earlier in this report, the single result available for each of the sample points cannot be interpreted as representing average conditions at that point. Nevertheless, the sample results have been compared with permissible pollutant concentrations for waters discharged to a storm sewer or watercourse, as set out in the Metropolitan Toronto By-Law 2520. The following table summarizes the provisions of this sewer use by-law.

<u>CRITERION</u>	<u>METRO TORONTO BY-LAW 2520</u>
BOD ₅	20 ppm
Suspended Solids	30 ppm
Phenols	40 ppb
Total Coliform Bacteria	2400 per 100 ml

Since the stream is situated in an urban watershed, the sewer discharges should at least meet the above criteria.

5.2 Main Branch

The Main Branch of Highland Creek is that portion of the creek which flows in a more-or-less easterly direction from the confluence of the North and West Branches to its eventual point of discharge into Lake Ontario at the south-east corner of the Borough of Scarborough.

Of the 30 outfalls and tributary drainage courses examined along the Main Branch, 23 were flowing at the time of the investigation, and so were sampled. Fifteen of these were acceptable discharges; the criterion for BOD₅ was exceeded at one point, that for suspended solids at three, that for phenols at none, and that for total coliforms at eight. The outfalls having unacceptable discharges were H-1, H-3, H-5, H-9, H-13, H-16, H-25 and H-27.

Analytical results for the Main Branch are shown in Table I.

5.3 North Branch

The North Branch of Highland Creek originates from three principal tributaries draining areas north of Finch Avenue, and flows generally in a south-easterly direction to its confluence with the West Branch at a point just west of the Morningside Park area. Along the North Branch and its tributaries, 82 points of actual or potential discharge were found, and 23 of these were flowing sufficiently to allow sampling.

Of those sampled, 17 were acceptable discharges. The unacceptable discharges failed to meet one or more of the criteria as follows: BOD₅ at two points, suspended solids at five, phenols at none, and total coliforms at one point. In addition, at one outfall, there was a significant concentration of anionic detergents as ABS. The outfalls having unacceptable discharges were HN-33, HN-46, HN-51, HN-52, HN-68, and HN-83.

Analytical results for the North Branch are shown in Table II.

5.4 West Branch

The West Branch has a number of small tributaries, and flows in a direction roughly parallel to that of the North Branch until it reaches the Scarboro Golf and Country

Club, whence it flows north-easterly to its confluence with the North Branch. The West Branch and its various tributaries had 188 points of actual or potential inflow, of which 59 were sampled; the rest had either no flow or negligible flow at the time of the sampling runs.

Of the sources which were sampled, 31 were judged to be acceptable discharges. Those which were deemed unacceptable exceeded one or more of the criteria as follows: BOD₅ at four points, suspended solids at 11, phenols at two, and total coliforms at 20 points. The outfalls having unacceptable discharges were HW-7, HW-12, HW-32, HW-36, HW-45, HW-49, HW-56, HW-57, HW-67, HW-68, HW-69, HW-71, HW-80, HW-81, HW-92, HW-123, HW-131, HW-132, HW-135, HW-144, HW-146, HW-148, HW-150, HW-179, HW-181, HW-190, HW-191, and HW-192.

Analytical results for the West Branch are shown in Table III.

5.5 Stream Survey

Following the initial week of field work, the creek itself was sampled at 13 points throughout its length on one day (May 19, 1971) in order to obtain some small amount of data which would enable a rough comparison of water quality to be made among the different sections of the creek. The results of chemical analyses and bacteriological examinations of these samples are included in Table IV, and the sampling

points are identified by location in Appendix IV.

From the results of this one-day overall survey of the stream, it was possible to establish only that there is a high input of iron from the upper end of Malvern Creek and high inputs of BOD₅ , coliform bacteria, anionic detergents, zinc, and copper between Kingston Road and the mouth of the creek (presumably in the effluent from the Highland Creek Water Pollution Control Plant).

Here again, it must be emphasized that single results from any given sample point have only limited significance, and cannot be considered to represent typical (average) values. Thus, with the exceptions noted above, no concrete conclusions can be drawn from the stream sampling survey conducted on May 19.

5.6 Discussion of Results

Despite the fact that it is dangerous to generalize from a single sample result, a few of the results of this survey are considered to be bad enough to warrant immediate corrective measures by the municipality. The offending outfall locations are the following: H-3, H-13, H-25, HN-51, HN-52, HN-68, HW-57, HW-68, HW-69, HW-71, HW-80, HW-123, HW-131, and HW-148.

By using the outfall descriptions in Appendices I to III in conjunction with the enclosed maps of Highland Creek, the municipality (i.e., the Borough of Scarborough)

should locate the above-noted outfalls in the field and trace back through each system to locate and eliminate the pollution source. In a couple of places (specifically, outfalls HN-68 and HW-80), it appears quite probable that high phenols and suspended solids concentrations are the result of industrial waste discharges. If this should prove to be the case, the municipality should act to enforce the appropriate sewer use by-law.

For the remaining outfalls whose discharges have been deemed "unacceptable" on the basis of this survey's single sample run, there is a need for further investigation by the municipality. Some 28 outfalls fall within this category, and the effluents from these should be sampled several times each under various weather conditions to provide a more accurate picture of their average quality. Those points having discharges of consistently poor quality should then be investigated further as suggested above.

Prepared by:

I.C. Kennedy
I.C. Kennedy, Engineer,
District Engineers Branch,
Division of Sanitary Engineering.

/elc

ANALYTICAL RESULTS - MAIN BRANCH

<u>SAMPLE POINT</u>	<u>DATE SAMPLED (1971)</u>	<u>5-DAY BOD (ppm)</u>	<u>SOLIDS (ppm)</u>			<u>PHENOLS (ppb)</u>	<u>COLIFORMS/100 ml</u>		<u>ANIONIC DETERGENTS AS ABS</u>	<u>CHLORIDES AS Cl (ppm)</u>
			<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>		<u>FAECAL</u>	<u>TOTAL</u>		
H-1	May 12	19.0	700	20	680	10	350	132,000		
H-2	May 12	3.5	540	25	515	4	20	1,140		
H-3	May 12	14.0	1440	40	1400	8	4000	200,000	1.0	
H-4	May 12	1.0	1140	5	1135	12	<10	<10		
H-5	May 12	3.5	900	30	870	4	40	8,000		
H-6	May 12	1.2	1020	5	1015	8	140	2,300		
H-7	May 12	0.6	520	5	515	10	<10	150		
H-8	May 12	0.8	780	5	775	0	<10	1,200		
H-9	May 12	0.6	840	5	835	6	40	50,000		
H-13	May 11	12.0	1420	70	1350	6	180,000	300,000		
H-15	May 11	0.8	1360	25	1335	6	<10	<10		
H-16	May 11	-	-	-	-	-	6,000	16,000		
H-17	May 11	3.0	400	20	380	4	290	1,240		
H-18	May 11	0.4	560	5	555	2	10	10		
H-19	May 11	0.4	240	5	235	2	<10	<10	0	32
H-20	May 11	0.8	720	5	715	6	10	100		

TABLE I (CONTD)

SAMPLE POINT	DATE SAMPLED (1971)	5-DAY BOD (ppm)	SOLIDS (ppm)			PHENOLS (ppb)	COLIFORMS/100 ml		ANIONIC DETERGENTS AS ABS	CHLORIDES AS Cl (ppm)
			TOTAL	SUSP.	DISS.		FAECAL	TOTAL		
H-22	May 11	1.0	720	5	715	2	50	40		
H-23	May 11	1.4	700	5	695	2	<10	30		
H-24	May 11	0.4	840	5	835	25	<10	<10		
H-25	May 11	42.0	1040	25	1015	20	>1,500	1,700,000		
H-27	May 11	5.0	4120	45	4075	2	800	2,500		
H-28	May 11	1.0	600	10	590	0	<10	20		
H-30	May 11	0.8	800	5	795	2	<10	<10		

ANALYTICAL RESULTS - NORTH BRANCH

<u>SAMPLE POINT</u>	<u>DATE SAMPLED (1971)</u>	<u>5-DAY BOD (ppm)</u>	<u>SOLIDS (ppm)</u>			<u>PHENOLS (ppb)</u>	<u>COLIFORMS/100 ml</u>		<u>IRON AS Fe (ppm)</u>	<u>ANIONIC DETERGENTS AS ABS</u>
			<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>		<u>FAECAL</u>	<u>TOTAL</u>		
HN-1	May 11	1.4	440	5	435	0	<10	230		
HN-2	May 11	1.4	1220	5	1215	4	200	1,000		
HN-4	May 11	0.4	380	5	375	2	<10	40		
HN-11	May 11	0.8	1080	5	1075	2	50	310		
HN-13	May 11	0.8	380	10	370	0	<10	<10		
HN-15	May 11	0.4	800	5	795	2	<10	<10		
HN-17	May 14	0.4	-	-	-	8	<10	630		
HN-24	May 14	0.4	-	-	-	2	<10	<10		
HN-25	May 14	1.2	-	-	-	2	60	400		
HN-26	May 11	0.8	520	10	510	0	<10	30		
HN-27	May 11	0.6	1180	5	1175	2	<10	20	0.45	
HN-28	May 11	0.4	520	5	515	2	<10	<10		
HN-29	May 11	0.2	920	5	915	4	<10	<10		
HN-30	May 11	-	-	-	-	-	<10	20		
HN-32	May 12	0.6	660	15	645	6	<10	<10		
HN-33	May 12	2.0	1340	50	1290	6	100	1,600		
HN-39	May 12	2.0	2120	20	2100	10	170	410		

TABLE II (CONTD)

SAMPLE POINT	DATE SAMPLED (1971)	5-DAY BOD (ppm)	SOLIDS (ppm)			PHENOLS (ppb)	COLIFORMS/100 ml		IRON AS Fe (ppm)	ANIONIC DETERGENTS	
			TOTAL	SUSP.	DISS.		FAECAL	TOTAL		AS	ABS
HN-46	May 12	3.5	2500	70	2430	2	<10	<10			
HN-48	May 12	3.5	2480	10	2470	10	10	2,100			
HN-51	May 12	80.0	680	140	540	18	100	600			
HN-52	May 12	95.0	640	80	560	2	<100	<100		5.2	
HN-68	May 13	11.0	660	160	500	40	<10	10		0.1	
HN-70	May 13	0.4	1400	10	1390	2	<10	<10			
HN-82	May 13	1.4	1600	10	1590	4	<10	100			
HN-83	May 13	3.5	880	10	870	4	<10	3,100			
HN-85	May 13	-	-	-	-	-	<10	10			

TABLE III

ANALYTICAL RESULTS - WEST BRANCH

<u>SAMPLE POINT</u>	<u>DATE SAMPLED (1971)</u>	<u>5-DAY BOD (ppm)</u>	<u>SOLIDS (ppm)</u>			<u>PHENOLS (ppb)</u>	<u>COLIFORMS/100 ml</u>		<u>IRON AS Fe (ppm)</u>	<u>CHLORIDES AS Cl (ppm)</u>
			<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>		<u>FAECAL</u>	<u>TOTAL</u>		
HW-1	May 14	1.0	-	-	-	6	100	970		
HW-3	May 14	0.8	-	-	-	2	20	1,330		
HW-6	May 14	0.4	-	-	-	2	<10	<10		
HW-7	May 14	0.4	-	-	-	2	440	5,300		
HW-8	May 14	1.0	-	-	-	2	80	840		
HW-9	May 14	2.5	-	-	-	2	50	860		
HW-10	May 14	6.0	-	-	-	4	90	6,200		
HW-12	May 14	18.0	-	-	-	4	60	14,800		
HW-13	May 14	0.6	-	-	-	4	<10	50		
HW-16	May 14	1.6	-	-	-	4	<10	140		
HW-17	May 14	0.4	-	-	-	4	40	1,170		
HW-21	May 14	0.8	-	-	-	2	<10	140		
HW-32	May 14	-	-	-	-	2	<10	2,800		
HW-33	May 14	0.6	-	-	-	2	<10	300		
HW-34	May 14	13.0	-	-	-	2	10	390		
HW-35	May 14	2.5	-	-	-	4	90	1,230		
HW-36	May 14	3.0	-	-	-	2	1,300	390,000		

TABLE III (CONT'D)

SAMPLE POINT	DATE SAMPLED (1971)	5-DAY BOD (ppm)	SOLIDS (ppm)			PHENOLS (ppb)	COLIFORMS/100 ml		IRON AS Fe (ppm)	CHLORIDES AS Cl (ppm)	
			TOTAL	SUSP.	DISS.		FAECAL	TOTAL			
HW-39	May 14	0.4	-	-	-	2	780	1,300			
HW-45	Aug.20	4.5	730	10	720	4	520	17,300			
HW-49	Aug.20	6.5	840	10	830	4	700	56,000	2.5		
HW-52	Aug.20	4.0	590	10	580	4	<10	100		77	
HW-55	Aug.20	2.0	840	10	830	2	<10	130			
HW-56	Aug.20	3.0	900	10	890	2	100	75,000			
HW-57	Aug.20	12.0	690	10	680	4	10,000	130,000			
HW-67	Aug.31	1.6	2000	5	1995	10	1,200	17,100			
HW-68	Aug.31	200.0	1130	10	1120	40	356	131,000			
HW-69	Aug.31	5.0	880	30	850	15	31,000	121,000			
HW-71	Aug.31	75.0	780	5	775	10	108	10,700			
HW-76	Aug.31	0.2	260	5	255	8	1	1			
HW-80	Aug.31	16.0	600	70	530	60	4	470			
HW-81	May 14	5.0	-	-	-	2	3,900	16,200			
HW-82	May 14	2.5	-	-	-	2	80	900			
HW-88	May 14	3.5	-	-	-	2	80	1,220			
HW-90	May 13	6.5	280	5	275	12	<10	20			
HW-92	May 13	1.4	2240	70	2170	2	10	1,200			

TABLE III (CONT'D)

SAMPLE POINT	DATE SAMPLED (1971)	5-DAY BOD (ppm)	SOLIDS (ppm)			PHENOLS (ppb)	COLIFORMS/100 ml		IRON AS Fe (ppm) ,	CHLORIDES AS Cl (ppm)
			TOTAL	SUSP.	DISS.		FAECAL	TOTAL		
HW-93	May 13	0.6	300	5	295	4	< 10	< 10		
HW-95	May 13	1.8	860	10	850	2	< 10	30		
HW-98	May 13	1.4	1580	20	1560	0	< 10	< 10		
HW-111	May 13	1.4	380	10	370	4	60	2,400		
HW-119	May 13	0.4	240	5	235	2	< 10	< 10		
HW-121	May 13	2.0	880	5	875	8	< 10	2,300		
HW-123	May 12	24.0	3240	50	3190	25	52,000	1,190,000		
HW-131	May 12	44.0	1270	45	1225	4	< 100	> 150,000		
HW-132	May 12	3.0	550	30	520	2	130	7,800		
HW-135	May 12	10.0	1060	5	1055	4	370	4,000		
HW-138	May 12	2.0	720	5	715	4	< 10	660		
HW-144	May 12	8.0	2080	35	2045	6	< 10	1,800		
HW-145	May 12	1.0	1700	15	1685	0	220	2,400		
HW-146	May 12	7.0	2160	200	1960	8	20	110		
HW-148	May 12	4.5	560	10	550	60	20	> 15,000		
HW-150	May 12	4.5	980	80	900	4	360	21,400		
HW-152	May 12	3.5	980	10	970	10	20	2,800		
HW-152	May 11	3.0	880	15	865	4	10	140		
HW-162	May 11	3.0	1460	5	1455	8	310	900		

TABLE III (CONT'D)

SAMPLE POINT	DATE SAMPLED (1971)	5-DAY BOD (ppm)	SOLIDS (ppm)			PHENOLS (ppb)	COLIFORMS/100 ml		IRON AS Fe (ppm)	CHLORIDES AS Cl (ppm)
			TOTAL	SUSP.	DISS.		FAECAL	TOTAL		
HW-163	May 11	1.2	1120	5	1115	10	<10	<10		
HW-166	May 11	5.5	550	20	530	2	<10	20		
HW-167	May 11	5.5	300	20	280	15	<10	<10		
HW-179	May 11	19.0	1180	100	1080	10	<10	<10		
HW-180	May 11	0.8	1460	5	1455	20	<10	20		
HW-181	May 11	2.0	780	70	710	2	<10	<10		
HW-185	May 11	1.1	1500	5	1495	2	170	190		
HW-190	May 11	3.0	800	5	795	4	8,800	14,400		
HW-191	May 11	1.6	1000	100	900	8	<10	10		
HW-192	May 11	1.4	660	230	430	2	<10	10		

ANALYTICAL RESULTS - STREAM SURVEY

<u>SAMPLE POINT</u>	<u>5-DAY BOD (ppm)</u>	<u>SOLIDS (ppm)</u>			<u>COLIFORMS/100 ml</u>		<u>PHENOLS (ppb)</u>	<u>ANIONIC DETERGENTS</u>	
		<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>	<u>FAECAL</u>	<u>TOTAL</u>		<u>AS</u>	<u>ABS</u>
HO-1	90.0	-	-	-	6,000	161,100,000	20	0.8	
HO-2	3.5	-	-	-	100	3,100	4	0.1	
HO-3	2.0	-	-	-	< 100	1,800	2	0	
HO-4	1.4	-	-	-	20	2,100	2	0	
HO-5	0.6	-	-	-	< 100	500	2	0	
HO-6	1.8	-	-	-	70	3,700	2	0	
HO-7	1.6	-	-	-	< 10	320	2	0.1	
HO-8	7.0	1100	5	1095	< 10	270	4	0.1	
HO-9	3.5	-	-	-	< 10	2,000	4	0.1	
HO-10	4.0	-	-	-	10	500	10	0.1	
HO-11	3.0	-	-	-	-	-	15	0.1	
HO-12	5.0	-	-	-	1,800	7,300	4	0.1	
HO-13	3.0	650	10	640	10	4,800	2	0.1	

NOTE: ALL SAMPLES TAKEN ON MAY 19, 1971.

ANALYTICAL RESULTS - STREAM SURVEY

<u>SAMPLE POINT</u>	(ppm) <u>CHLORIDES</u> <u>AS Cl</u>	(ppm) <u>CHROMIUM</u> <u>AS Cr</u>	(ppm) <u>ZINC AS</u> <u>Zn</u>	(ppm) <u>COPPER AS</u> <u>Cu</u>	(ppm) <u>LEAD AS</u> <u>Pb</u>	(ppm) <u>IRON AS</u> <u>Fe</u>
HO-1	126	0.06	0.23	0.18	0	1.50
HO-2	140	0	0.02	0	0	0.55
HO-3	123	0.02	0.02	0	0	0.70
HO-4	51	0	0.04	0	0	2.40
HO-5	31	0	0.02	0	0	7.40
HO-6	101	0.03	0.02	0	0	0.25
HO-7	421	0.02	0.03	0	0	0.20
HO-8	382	0.03	0.02	0	0	0.10
HO-9	205	0.02	0.03	0	0	0.55
HO-10	223	0.02	0.04	0	0	0.30
HO-11	237	0.04	0.10	0	0	0.30
HO-12	177	0.02	0.04	0	0	0.45
HO-13	153	0.02	0.14	0	0	0.25

NOTE: ALL SAMPLES TAKEN ON MAY 19, 1971.

APPENDIX I

POINTS OF DISCHARGE TO MAIN BRANCH

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
H-1	west side, final effluent outfall from Highland Creek WPCP	X	
H-2	west side, concrete flow-way from drainage course	X	
H-3	west side, concrete pipe	X	
H-4	east side, weir outfall from pond	X	
H-5	east side, drainage course	X	
H-6	west side, drainage course	X	
H-7	west side, drainage course	X	
H-8	west side, drainage course	X	
H-9	west side, drainage course	X	
H-10	west side, 3"Ø plastic pipe		X
H-11	south side, 12"Ø storm drain		X
H-12	south side, 12"Ø storm drain		X
H-13	east side, 24"Ø CMP	X	
H-14	east side, 12"Ø CMP under Kingston Road bridge		X
H-15	east side, 18"Ø CMP	X	
H-16	west side, 12"Ø CMP under Kingston Road bridge	X	
H-17	west side, drainage course	X	
H-18	north side, drainage course	X	
H-19	north side, 30"Ø concrete pipe	X	
H-20	north side, 12"Ø CMP	X	

APPENDIX I (CONTD)

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
H-21	north side, 30"Ø concrete pipe	X	
H-22	north side, 48"Ø CMP	X	
H-23	north side, 36"Ø CMP	X	
H-24	south side, 30"Ø CMP under Morningside Avenue bridge	X	
H-25	south side, 48"Ø cast iron outfall with iron door	X	
H-26	south side, 4"Ø CMP		X
H-27	south side, 12"Ø CMP	X	
H-28	south side, 8"Ø CMP	X	
H-29	south side, 8"Ø CMP		X
H-30	north side, 16"Ø CMP under bridge	X	

APPENDIX II

POINTS OF DISCHARGE TO NORTH BRANCH

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HN-1	North Branch at junction with West Branch	X	
HN-2	west side, open CMP storm drain	X	
HN-3	east side, 30"Ø concrete pipe		X
HN-4	west side, drainage course from spring	X	
HN-5	east side, drainage ditch		X
HN-6	west side, drainage ditch		X
HN-7	east side, drainage ditch		X
HN-8	west side, drainage course		X
HN-9	west side, drainage course		X
HN-10	east side, drains at Military Road bridge		X
HN-11	west side, 54"Ø CMP	X	
HN-12	east side, 48"Ø concrete pipe		X
HN-13	Malvern Creek at North Branch	X	
HN-14	west side, drainage course		X
HN-15	west side, 24"Ø concrete pipe	X	
HN-16	east side, drainage ditch		X
HN-17	north side, drainage course	X	
HN-18	north side, seepage		X
HN-19	north side, drainage course		X
HN-20	east side, drainage course		X
HN-21	east side, drainage course		X
HN-22	west side, drainage course		X

APPENDIX II (CONTD)

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HN-23	west side, drainage course		X
HN-24	east side, drainage course	X	
HN-25	Malvern Creek south of Sheppard Avenue	X	
HN-26	North Branch at Malvern Creek	X	
HN-27	north side, 21"Ø CMP under Carmelite Drive	X	
HN-28	south side, drainage course	X	
HN-29	south side, 48"Ø concrete pipe at Markham Road	X	
HN-30	north side, drainage course	X	
HN-31	north side, concrete pipe under Progress Avenue		X
HN-32	east side, 36"Ø concrete pipe	X	
HN-33	east side, 72"Ø concrete pipe	X	
HN-34	north side, 12"Ø CMP		X
HN-35	north side, 36"Ø concrete pipe		X
HN-36	north side, 18"Ø CMP		X
HN-37	south side, 15"Ø CMP		X
HN-38	north side, 15"Ø CMP		X
HN-39	south side, 60"Ø concrete pipe	X	
HN-40	north side, 15"Ø CMP		X
HN-41	south side, 15"Ø CMP		X
HN-42	north side, 33"Ø concrete pipe		X
HN-43	south side, 84"Ø concrete pipe		X
HN-44	west side, 24"Ø CMP		X
HN-45	east side, drainage course	X	

APPENDIX II (CONTD)

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HN-46	east side, 15"Ø tile drain	X	
HN-47	numerous drains under Highway 401		X
HN-48	east side, 60"Ø CMP at Milner Avenue	X	
HN-49	east side, 24"Ø concrete pipe		X
HN-50	west side, 12"Ø CMP		X
HN-51	east side, 42"Ø concrete pipe	X	
HN-52	west side, 33"Ø concrete pipe under Invergordon Avenue	X	
HN-53	east side, 12"Ø CMP		X
HN-54	east side, 12"Ø CMP		X
HN-55	west side, 12"Ø CMP		X
HN-56	west side, 96"Ø concrete pipe		X
HN-57	10"Ø CMP drains under Sheppard Avenue		X
HN-58	east side, drainage course		X
HN-59	west side, 24"Ø concrete pipe		X
HN-60	east side, 12"Ø CMP		X
HN-61	west side, 12"Ø CMP		X
HN-62	east side, 12"Ø CMP		X
HN-63	west side, 12"Ø CMP		X
HN-64	east side, 12"Ø CMP		X
HN-65	south side, 18"Ø concrete pipe at McCowan Road		X
HN-66	north side, 36"Ø concrete pipe at McCowan Road		X
HN-67	south side, 24"Ø concrete culvert from old course of creek		X

APPENDIX II (CONTD)

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HN-68	north side, 12"Ø concrete pipe at cement plant	X	
HN-69	south side, 12"Ø CMP		X
HN-70	south side, 30"Ø concrete pipe near CPR	X	
HN-71	west side, 60"Ø concrete pipe		X
HN-72	east side, 60"Ø concrete pipe from industrial park		X
HN-73	east side, 24"Ø CMP from industrial park		X
HN-74	west side, 24"Ø CMP from drainage ditch		X
HN-75	north side, 54"Ø concrete pipe		X
HN-76	north side, 33"Ø concrete pipe at Brimley Road		X
HN-77	north side, 48"Ø concrete pipe		X
HN-78	south side, 24"Ø concrete pipe		X
HN-79	south side, 8"Ø tile drain from school yard		X
HN-80	south side, 33"Ø concrete pipe		X
HN-81	north side, 10"Ø CMP		X
HN-82	north side, 60"Ø concrete pipe	X	
HN-83	south side, 48"Ø concrete pipe	X	
HN-84	south side, 60"Ø CMP (to be removed)		X
HN-85	north side, 30"Ø pipe at Midland Avenue	X	

- 32 -
APPENDIX III
POINTS OF DISCHARGE TO WEST BRANCH

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HW-1	west side, drainage course	X	
HW-2	east side, drainage course		X
HW-3	east side, drainage course	X	
HW-4	west side, 16"Ø CMP		X
HW-5	east side, 12"Ø CMP		X
HW-6	west side, 8"Ø CMP	X	
HW-7	east side, 36"Ø CMP	X	
HW-8	east side, drain from 30"Ø concrete pipe	X	
HW-9	west side, drainage course	X	
HW-10	West Branch at junction with HW-9	X	
HW-11	south side, drainage course		X
HW-12	north side, drainage course	X	
HW-13	south side, drainage course	X	
HW-14	west side, 12"Ø CMP		X
HW-15	west side, 12"Ø CMP		X
HW-16	west side, drainage course	X	
HW-17	east side, 16"Ø CMP	X	
HW-18	west side, 12"Ø cast iron pipe		X
HW-19	east side, CMP from drainage couse		X
HW-20	south side, CMP from drainage course		X
HW-21	west side, drainage course	X	
HW-22	south side, 15"Ø CMP		X
HW-23	south side, 24"Ø concrete pipe		X
HW-24	south side, 12"Ø CMP		X

APPENDIX III (CONTD)

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HW-25	north side, 27"Ø concrete pipe		X
HW-26	south side, 36"Ø CMP		X
HW-27	north side, 18"Ø CMP		X
HW-28	north side, 30"Ø concrete pipe		X
HW-29	south side, 24"Ø CMP		X
HW-30	east side, 6"Ø CMP		X
HW-31	north side, 12"Ø concrete pipe		X
HW-32	north side, concrete pipe	X	
HW-33	north side, 4"Ø CMP	X	
HW-34	north side, 27"Ø concrete pipe	X	
HW-35	south side, drainage course	X	
HW-36	south side, 36"Ø concrete pipe	X	
HW-37	south side, 12"Ø CMP at Bellamy Road		X
HW-38	north side, 12"Ø CMP at Bellamy Road		X
HW-39	south side, 12"Ø CMP swamp drain	X	
HW-40	north side, 30"Ø concrete pipe		X
HW-41	south side, drainage course		X
HW-42	west side, drainage course from spring		X
HW-43	east side, 27"Ø concrete pipe and ditch		X
HW-44	east side, 18"Ø CMP		X
HW-45	south side, 60"Ø concrete pipe	X	
HW-46	south side, 15"Ø CMP		X
HW-47	south side, flow-way from 15"Ø CMP		X
HW-48	north side, flow-way from 15"Ø CMP		X

APPENDIX III (CONTD)

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HW-49	south side, 42"Ø CMP	X	
HW-50	north side, 30"Ø concrete pipe at Danforth Road		X
HW-51	south side, 21"Ø concrete pipe		X
HW-52	south side, 6"Ø tile drain	X	
HW-53	south side, 4"Ø drain pipe		X
HW-54	north side, 72"Ø CMP		X
HW-55	south side, drainage course, Knob Hill Park	X	
HW-56	south side, 66"Ø CMP	X	
HW-57	south side, 66"Ø concrete pipe	X	
HW-58	north side, 30"Ø CMP		X
HW-59	south side, 54"Ø CMP		X
HW-60	south side, 15"Ø concrete pipe		X
HW-61	north side, 42"Ø CMP		X
HW-62	west side, 18"Ø concrete pipe		X
HW-63	west side, 24"Ø CMP		X
HW-64	south side, eight 4"Ø tile drains		X
HW-65	west side, 30"Ø concrete pipe		X
HW-66	west side, drainage course		X
HW-67	east side, 30"Ø concrete pipe	X	
HW-68	east side, 60"Ø CMP	X	
HW-69	east side, 24"Ø concrete pipe	X	
HW-70	east side, 30"Ø concrete pipe		X
HW-71	north side, 5'x10' concrete culvert	X	
HW-72	south side, 30"Ø concrete pipe		X

APPENDIX III (CONTD)

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HW-73	west side, 12"Ø CMP		X
HW-74	east side, 12"Ø drain pipe		X
HW-75	west side, 39"Ø concrete pipe		X
HW-76	east side, 60"Ø concrete pipe	X	
HW-77	west side, 30"Ø concrete pipe		X
HW-78	east side, 30"Ø concrete pipe		X
HW-79	west side, 21"Ø concrete pipe		X
HW-80	origin of tributary, 72"Ø CMP	X	
HW-81	west side, mouth of major tributary	X	
HW-82	west side, 30"Ø CMP	X	
HW-83	east side, 9"Ø concrete pipe		X
HW-84	east side, 36"Ø CMP		X
HW-85	west side, 36"Ø CMP		X
HW-86	east side, 36"Ø concrete pipe		X
HW-87	north side, 24"Ø concrete pipe		X
HW-88	West Branch at McCowan Road	X	
HW-89	west side, three cast iron pipes		X
HW-90	south side, 18"Ø concrete pipe	X	
HW-91	north side, 12"Ø CMP		X
HW-92	south side, 21"Ø concrete pipe	X	
HW-93	south side, 24"Ø concrete pipe	X	
HW-94	north side, 24"Ø concrete pipe		X
HW-95	north side, drainage course	X	
HW-96	north side, 60"Ø concrete pipe		X

APPENDIX III (CONTD)

DESIGNATION	DESCRIPTION	<u>SAMPLED</u>	
		YES	NO
HW-97	west side, 24"Ø CMP		X
HW-98	north side, 24"Ø concrete pipe	X	
HW-99	south side, 24"Ø concrete pipe		X
HW-100	west side, 30"Ø concrete pipe		X
HW-101	west side, 15"Ø concrete pipe		X
HW-102	east side, 21"Ø concrete pipe		X
HW-103	south side, 18"Ø concrete pipe		X
HW-104	north side, 27"Ø concrete pipe		X
HW-105	west side, 27"Ø concrete pipe		X
HW-106	north side, 27"Ø concrete pipe		X
HW-107	east side, 30"Ø concrete pipe		X
HW-108	east side, 72"Ø concrete pipe		X
HW-109	west side, 24"Ø concrete pipe		X
HW-110	east side, 21"x36" oval CMP		X
HW-111	north side, 72"Ø concrete pipe	X	
HW-112	south side, 18"Ø concrete pipe		X
HW-113	north side, 10"Ø concrete pipe		X
HW-114	north side, 10"Ø AC pipe		X
HW-115	north side, 10"Ø AC pipe		X
HW-116	north side, 21"Ø CMP		X
HW-117	south side, 6"Ø CMP		X
HW-118	south side, 4"Ø CMP		X
HW-119	south side, 24"Ø concrete pipe	X	
HW-120	north side, 15"Ø concrete pipe		X

APPENDIX III (CONTD)

DESIGNATION	DESCRIPTION	SAMPLED	
		YES	NO
HW-121	West Branch at Midland Avenue	X	
HW-122	north side, 6"Ø concrete pipe		X
HW-123	south side, 33"Ø concrete pipe	X	
HW-124	south side, parking lot drain		X
HW-125	north side, 18"Ø concrete pipe		X
HW-126	south side, parking lot drain		X
HW-127	south side, 15"Ø CMP		X
HW-128	north side, 15"Ø CMP		X
HW-129	north side, drainage course		X
HW-130	north side, drainage course		X
HW-131	north side, 33"Ø concrete pipe	X	
HW-132	south side, 48"Ø concrete pipe	X	
HW-133	north side, 6"Ø AC drain		X
HW-134	north side, 6"Ø AC drain		X
HW-135	west side, drainage from 90"Ø outfall	X	
HW-136	south side, 4"Ø perforated CMP		X
HW-137	east side, 30"Ø concrete pipe		X
HW-138	west side, swamp drainage	X	
HW-139	west side, 18"Ø CMP		X
HW-140	east side, 18"Ø CMP		X
HW-141	east side, 18"Ø CMP		X
HW-142	east side, 8"Ø concrete pipe		X
HW-143	west side, 8"Ø concrete pipe		X
HW-144	west side, 36"x72" oval concrete pipe	X	

APPENDIX III (CONTD)

DESIGNATION	DESCRIPTION	SAMPLED	
		YES	NO
HW-145	east side, 48"Ø concrete pipe	X	
HW-146	west side, 24"Ø CMP	X	
HW-147	east side, 48"Ø concrete pipe		X
HW-148	east side, 72"Ø concrete pipe	X	
HW-149	west side, 36"Ø concrete pipe		X
HW-150	east side, 36"Ø concrete pipe	X	
HW-151	east side, road drainage		X
HW-152	West Branch at Sheppard Avenue	X	
HW-153	east side, road drainage		X
HW-154	east side, 4"Ø drain		X
HW-155	east side, 2"Ø drain		X
HW-156	east side, 2"Ø drain		X
HW-157	west side, 2"Ø drain		X
HW-158	east side, 10"Ø CMP		X
HW-159	west side, 10"Ø CMP		X
HW-160	west side, 36"Ø concrete pipe		X
HW-161	east side, drainage course		X
HW-162	east side, 72"Ø concrete pipe	X	
HW-163	west side, 10"Ø CMP	X	
HW-164	west side, 10"Ø CMP		X
HW-165	west side, 4"Ø CMP		X
HW-166	east side, culvert from water hazard	X	
HW-167	south side, 4"Ø tile drain	X	
HW-168	south side, 10"Ø CMP		X

APPENDIX III (CONTD)

DESIGNATION	DESCRIPTION	SAMPLED	
		YES	NO
HW-169	south side, 42"Ø concrete pipe		X
HW-170	west side, 6"Ø CMP		X
HW-171	east side, 4"Ø CMP		X
HW-172	east side, 4"Ø CMP		X
HW-173	east side, 6"Ø CMP		X
HW-174	west side, 30"Ø concrete pipe		X
HW-175	east side, 48"Ø concrete pipe		X
HW-176	west side, 10"Ø CMP		X
HW-177	west side, 10'Ø CMP		X
HW-178	west side, 72"Ø concrete pipe		X
HW-179	east side, 27"Ø	X	
HW-180	west side, 42"Ø CMP	X	
HW-181	east side, drainage course	X	
HW-182	west side, 24"Ø concrete pipe		X
HW-183	west side, 10"Ø CMP		X
HW-184	east side, 48"Ø concrete pipe		X
HW-185	west side, 48"Ø CMP	X	
HW-186	west side, 10"Ø CMP		X
HW-187	east side, 10"Ø CMP		X
HW-188	east side, drainage course		X
HW-189	west side, 18"Ø CMP		X
HW-190	west side, 66"Ø CMP	X	
HW-191	west side, 48"Ø concrete pipe	X	
HW-192	origin of creek - 72"Ø concrete pipe at Finch Avenue	X	

APPENDIX IV

SAMPLING POINT LOCATIONS - STREAM SURVEY

<u>DESIGNATION</u>	<u>DESCRIPTION</u>
HO-1	Highland Creek at mouth, South of CNR
HO-2	Main Branch South of Kingston Road
HO-3	Main Branch at Morningside Avenue
HO-4	North Branch at confluence with West Branch
HO-5	Malvern Creek at Sheppard Avenue
HO-6	North Branch at Markham Road
HO-7	North Branch at CPR North of Sheppard Avenue
HO-8	North Branch at McCowan Road
HO-9	West Branch at confluence with North Branch
HO-10	West Branch at Markham Road
HO-11	West Branch at Danforth Road East of Knob Hill Park
HO-12	West Branch at Ellesmere Road
HO-13	West Branch at Birchmount Road

APPENDIX V

METEOROLOGICAL DATA

DATE (1971)	TEMPERATURE (°F)		PRECIPITATION (inches)	
	HIGH	LOW	RAIN	SNOW
May 10	73	52	0	0
May 11	67	48	0	0
May 12	57	45	0.06	0
May 13	52	37	0	0
May 14	58	41	0	0
May 18	77	54	0	0
May 19	82	57	0.12	0
August 19	89	58	0	0
August 20	86	69	0.29	0
August 30	77	62	0.04	0
August 31	70	54	0	0

Data from Monthly Meteorological Summary for
Scarborough - Meteorological Branch - Department
of Transport - Canada.

APPENDIX VI

SEWAGE ANALYSIS

LAB. NO.	5-DAY BOD (ppm)	SOLIDS (ppm)			TOTAL KJELDAHL		TOTAL PHOSPHORUS	
		TOTAL	SUSP.	DISS.	AS	N	AS	P
31-230	160.	-	80	-	28.		6.5	
31-231	36.	-	20	-	21.		6.0	
31-232	200.	-	220	-	32.		7.5	
31-233	28.	-	20	-	23.		6.0	

31-230 Raw Sewage (Composite 10:30 August 4- 10:30 August 5)

31-231 Final Effluent (Composite 10:30 August 4- 10:30 August 5)

31-232 Raw Sewage (Composite 10:30 August 5- 10:30 August 6)

31-233 Final Effluent (Composite 10:30 August 5- 10:30 August 6)

APPENDIX VII

GLOSSARY

BIOCHEMICAL OXYGEN DEMAND (BOD₅) - The quantity of oxygen required during the stabilization of decomposable organic matter and oxidizable inorganic matter by aerobic biological action, measured over a five-day period at 20°C in the absence of light. BOD₅ is employed to indicate relative organic content of raw and treated sewage, surface waters, etc.

CMP - corrugated metal pipe.

CONTAMINATE - Introduce or release into a receiving water potentially pathogenic organisms or toxic substances that render the water hazardous for human consumption or domestic use.

COLIFORM BACTERIA - A class of bacteria which are natural inhabitants of the intestines of man and animals and which are present in human sewage in extremely high numbers. In addition, some species of coliform bacteria can be found in soil and decaying vegetation.

FAECAL COLIFORMS - Coliform bacteria of faecal origin whose presence in significant quantity denotes recent contact with human or animal waste.

OUTFALL - The outlet or mouth of a river, dam, sewer, etc., where it discharges to a lake, river, stream, etc.

PHENOLIC COMPOUNDS (Phenols) - Hydroxy derivatives of benzene and its condensed nuclei. They are usually present in surface water as a result of contact with petroleum products.

POLLUTE - Introduce or release into a receiving water substances of such volume and character that the natural quality of the water is altered so as to reduce its usefulness or render it offensive to sight, taste, or smell.

SANITARY SEWER - A sewer intended to carry domestic and industrial wastes only.

SEPARATE SEWER SYSTEM - A sewer system comprising two non-interconnected sets of sewers, one to carry domestic and industrial wastes (sanitary sewer) and one to carry storm water (storm sewer).

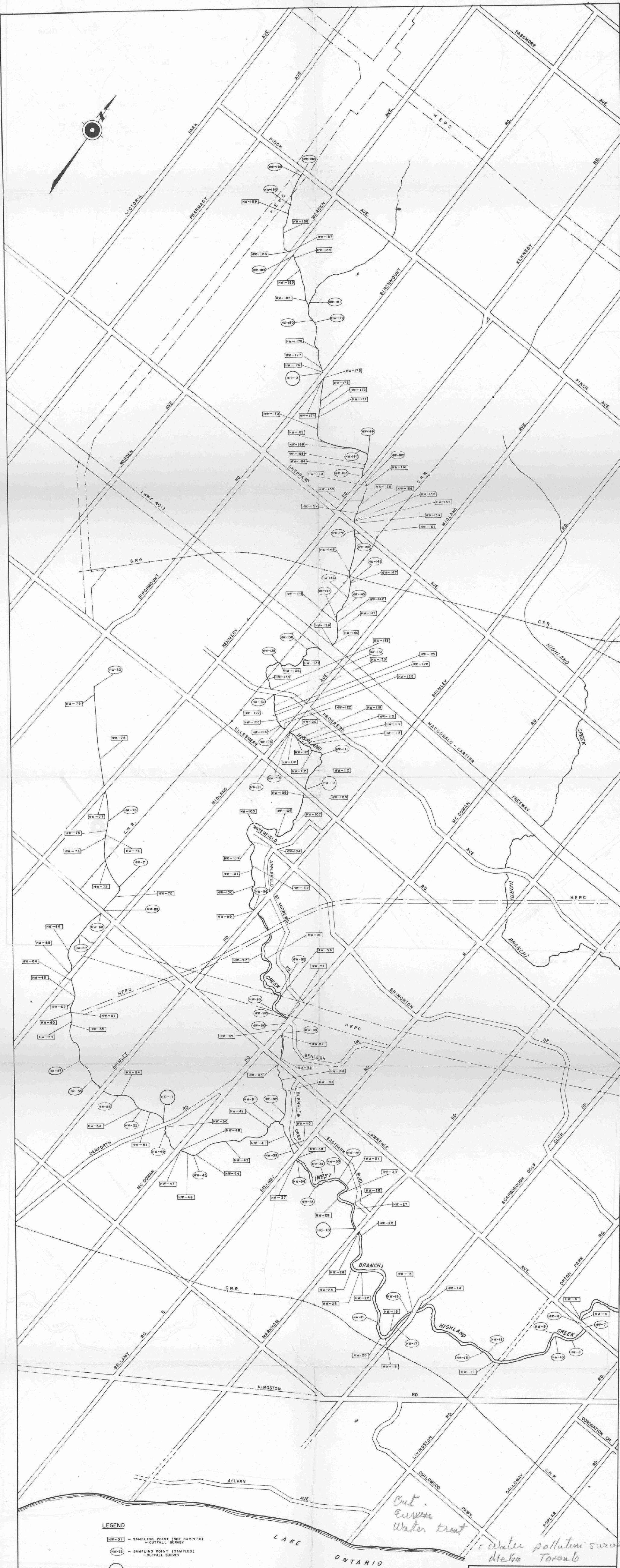
STORM SEWER - A sewer intended to carry only storm water and relatively unpolluted discharges (e.g., cooling waters).

Out
Post P

Water resources com
water pollution surveys
Metro Toronto

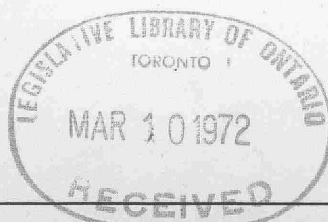


HIGHLAND CREEK W.



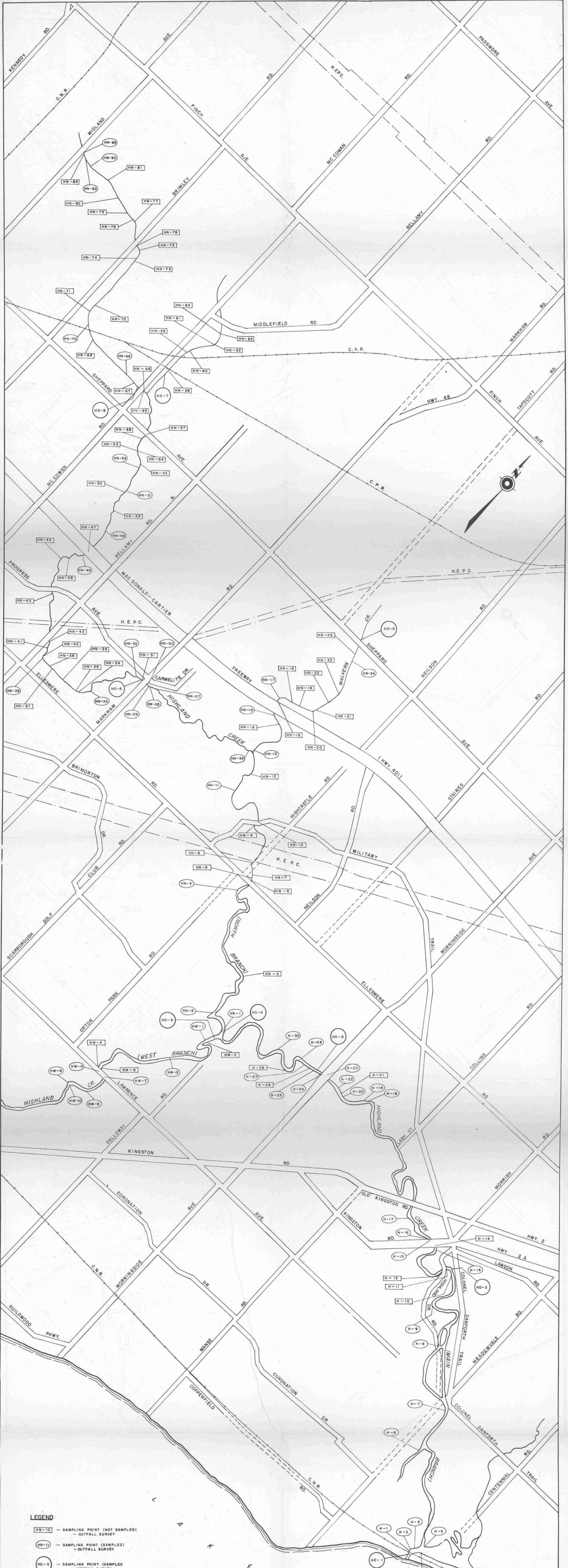
Out -
Current
Water treat

water pollution surveys
Metro Toronto



ONTARIO WATER RESOURCES COMMISSION	
HIGHLAND CREEK (WEST HALF)	
SCALE: 1000 0 1000 2000 FT.	DATE: JUNE, 1971
DRAWN BY: L.L. BROOME	CHECKED BY: I.K.
DRAWING NO: 71-51-DE	

HIGHLAND CREEK



LEGEND

- HN-10 - SAMPLING POINT (NOT SAMPLED)
- OUTFALL SURVEY
- HN-11 - SAMPLING POINT (SAMPLED)
- OUTFALL SURVEY
- HO-5 - SAMPLING POINT (SAMPLED)
- STREAM SURVEY



ONTARIO WATER RESOURCES COMMISSION

**HIGHLAND CREEK
(EAST HALF)**

SCALE 1000 0 1000 2000 FT

DRAWN BY L.L. BROOME DATE: JUNE, 1971

CHECKED BY I.K. DRAWING NO 71-50-DE

*Out
Upper
Water treat*

*Water pollution surveys
Metro Toronto*



96936000009192